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Sweeping machine, in particular carpet sweeper

The invention concerns a sweeping machine, in particular a carpet sweeper with rotating brush drum that is powered upon back and forth movement of the sweeping machine by at least two running wheels via coupling elements.

In carpet sweepers, the dirt that is captured by the brushes is to be swept into a dirt reception container, whereby it is necessary that the brush drum rotates independent of the direction of movement of the sweeper always in the same rotation direction. Carpet sweepers are known in which respectively only the rear brush drum is powered, while the front brush drum rolls freely off the carpet floor when the bristles come in contact with the carpet floor. Further, carpet sweepers are known in which, depending on the direction of movement as a result of moving a lever or the broom handle, the direction of rotation of the brush drums is changed.

It is the task of the invention to create a sweeping machine in which it is ascertained that the brushes always sweep into the dust reception container and that this sweeping action is also achieved when the sweeper runs on smooth flooring or is guided around corners. In that, powering of the brush drum shall be independent of the position of the sweeper's handle. The rotation movement of the brush drum shall also not be interrupted if the sweeper is tilted to the side somewhat and the wheels lift up from the floor on one side.

To solve this problem, a sweeping machine as mentioned at the beginning is suggested that is characterized by, that the brush drum can be powered by each one of the two running wheels either individually or together, in the same direction of rotation, independent of the direction of movement of the sweeper.

Preferably, each running wheel is connected with a spring-activated intermediate wheel which sits on the edge of the spindle that protrudes the brush drum on the side and that runs freely in one direction of rotation on the spindle, while it is firmly connected with the spindle via coupling elements in the opposite direction, and each running wheel via coupling elements and a toothed wheel transmission [is] connectable via spring activation with the end of the spindle that protrudes from the side of the brush drum when the intermediate wheel runs freely.

Further details of the invention can be seen in the two drawings given as examples of a preferred construction.

Fig. 1 shows a side view of a brush drum, running wheel and coupling elements on one side of a carpet sweeper.

Fig. 2 is a view from above of the carpet sweeping parts in accordance with Fig. 1.

Fig. 3 is a partial view from above of the carpet sweeper on a brush side.

Fig 4 is a frontal view of a representation in accordance with Fig. 3.

The parts of a carpet sweeper that are shown in a basically known way with four running wheels and two inward-turning brush drums, depicted in Fig. 1 and 2 a brush drum 1 with bristles 2 and two running wheels 3 and 4. Slightly protruding the brush drum at the end of brush drum 2 sit spindle ends 5 and 6 that are embedded in brush drum 1 and are firmly connected with it. On spindle end 5 or 6 respectively sits one intermediate wheel 7, 8 that is connected with corresponding running wheel 3 or 4 in a spring-activated manner. Through rotation of running wheels 3, 4, intermediate wheels 7, 8 are also imparted with rotation movement. Intermediate wheels 7, 8 can be connected firmly with a drum 6 in a rotation direction via wrapped spring 9, while the intermediate wheels 7 or 8 rotate freely in the opposite direction on spindle end 5 or 6.

Toothed ring 11 or 12 is positioned at the end of the axis of running wheel

10 that is connected via an intermediate wheel 13 or 14 with a toothed wheel 15 or 16. These toothed wheels 15, 16 sit firmly on spindle ends 5 or 6. Via a wrapped spring 17, the toothed wheels 11 or 12 can be firmly connected with the axis of running wheel 10, so that during rotation in a rotation direction of running wheels 3 or 4, they are taken along, while they run freely during an opposite direction of rotation of the running wheels.

The running wheels have the ability to slide vertically as can be seen in particular in Fig 1, and they are springably stored by means of a leaf spring 18, whereby it is ensured, however, that running wheels 3 or 4 remain engaged in every position with intermediate wheels 7 or 8 and toothed wheels 11 or 12 with intermediate toothed wheels 13 or 14.

If the carpet sweeper is moved to the right in accordance with Fig. 1 and 2 and running wheels 3 and 4 rotate accordingly, they thus impart a rotation movement to intermediate wheels 7, 8 in which, via wrapped spring 9, a firm connection between the intermediate wheels and brush drum 1 occurs, so that the brush drum is taken along in order to sweep the dirt towards the inside.

By moving the carpet sweeper in the opposite direction, a reverse direction of rotation is imparted to intermediate wheels 7 and 8. In this case the wrapped springs 9 do not become active, however, so that the intermediate wheels rotate freely on spindle ends 5, 6. Now, however, on account of wrapped springs 17, a connection between running wheels 3, 4 and the toothed wheels 11, 12 is created on account of which these toothed wheels rotate in the same direction as running wheels 3, 4. Through the intermediate toothed wheels 13, 14, the direction of rotation is reversed, while the engaged wheels 15 and 16 in turn have the same direction of rotation as toothed wheels 11, 12 or the running wheels 3, 4. Since the toothed wheels 15, 16 are firmly positioned on spindle ends 5, 6 and the spindle ends are firmly connected with brush drum 1, a rotation movement is imparted to it. This rotation movement is in the same direction as the previously described rotation movement, even though the carpet sweeper is now being moved in the opposite direction.

As is particularly recognizable in Fig. 2, power transmission to the brush drum comes from running wheel 3 as well as from running wheel 4. This has the consequence that each running wheel 3 or 4 individually or together with the other running wheel is in a position to impart the

desired direction of rotation to the brush drum. In that, the operativeness is also not disturbed if, for example, running wheel 3 were to run in one direction and running wheel 4 were to rotate in the opposite direction, as in each case brush drum 1 is always given the same direction of rotation.

In accordance with a special construction type as shown in Fig. 3 and 4, in addition to brush drum 1, a brush 19 is provided on each side which can be rotated vertical to the axis of revolution of the brush drum. The purpose of these brushes on the side is to extract dirt from the corners and to sweep it in front of the brush drum by which the dirt is then swept into the sweeper.

Brush 19 consists of a brush body 20 with bristles 21. The brush body is positioned on an axis 22 that is positioned in a carrier 23 that is shown as elbow piece, has the ability rotate and is attached to the sweeper's casing 24. On the brush body that is turned away from the bristles is a toothed ring 25 that is engaged with toothed wheel 15 that is positioned at spindle end 5. For this reason, brush 19 always turns when toothed wheel 15 turns, that is, in a movement direction of the sweeping machine.

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Trier, 12-9-1968

B 174

Patent Claims

1. Sweeping machine, in particular a carpet sweeper with rotating brush drum that is powered upon back and forth movement by at least two running wheels via coupling elements, characterized by, that brush drum (1), can be powered individually or together by one of the two running wheels (3, 4), always in the same direction of rotation, independent of the direction of movement of the sweeping machine.

2. Sweeping machine in accordance with claim 1, characterized by, that each running wheel (3 or 4) is connected by spring activation with an intermediate wheel (7 or 8), that is positioned on a spindle end (5 or 6) that protrudes on the side of brush drum (1) and that freely runs on the spindle in one direction of rotation, while, in the opposite direction it can be firmly connected with the spindle via coupling elements (9) and that each running wheel can be connected with spring activation via coupling elements (17) and a toothed wheel transmission (11, 13, 15 or 12, 14, 16)

with the spindle end that protrudes from the brush drum on the side when the intermediate wheel runs freely.

3. Sweeping machine in accordance with claims 1 and 2, characterized by, that the coupling elements between intermediate wheel (7 or 8) and spindle (5 or 6) or running wheel (3 or 4) and toothed wheel transmission (11, 13, 15, or 12, 14, 16) are shown as simple lockable wrapped springs (17).

4. Sweeping machine in accordance with claims 1 and 2, characterized by, that he toothed wheel transmissions consist of a toothed wheel (11 or 12) positioned on an axis of running wheel (10), a toothed wheel (15 or 16) that sits on a spindle end (5 or 6) that protrudes on the side of the brush drum and an intermediate toothed wheel 13) or 14) that connects both toothed wheels.

5. Sweeping machine in accordance with claims 1 through 4, characterized by, that the running wheels (3, 4), are vertically slideable and springably stored.

6. Sweeping machine in accordance with claims 1 through 5, characterized by, that each toothed wheel (15 or 16) that sits on the spindle ends (5 or 6) is

engaged with toothed ring (25) on a brush (19) that can be rotated and that is placed vertically on the side of brush drum (1).

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